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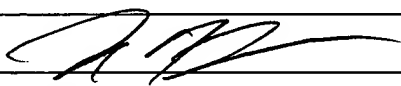
Application Number	09/578,027
Filing Date	May 24, 2000
First Named Inventor	Ron Cohen, et al.
Group Art Unit	2141
Examiner Name	Quang N. Nguyen

Total Number of Pages in This Submission	Attorney Docket Number	50325-0125
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ENCLOSURES (check all that apply)

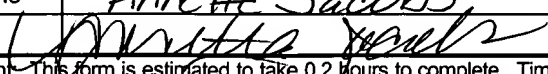
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<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Hickman Palermo Truong & Becker LLP
Signature	 Kirk D. Wong (Reg. No. 43,284)
Date	January 17, 2006

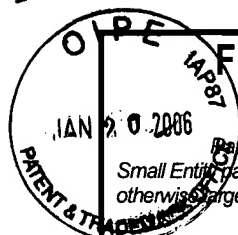
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TOTAL AMOUNT OF PAYMENT (\$)**500.00**

Complete if Known

Application Number 09/578,027
Filing Date May 24, 2000
First Named Inventor Ron Cohen, et al.
Examiner Name Quang N. Nguyen
Group/Art Unit 2141
Attorney Docket No. 50325-0125

METHOD OF PAYMENT (check one)

1. ☒ Throughout the pendency of this application, please charge any additional fees, including any required extension of time fees, and credit all overpayments to deposit account 50-1302. A duplicate of this sheet is enclosed.

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Deposit Account Name Hickman Palermo Truong & Becker, LLP

2. ☒ Payment Enclosed:
☒ Check ☐ Money Order ☐ Other

3. ☐ Applicant(s) is entitled to small entity status. See 37 CFR 1.27.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee (\$)	Small Entity Fee Code	Small Entity Fee (\$)	Fee Description	Fee Paid
1011	300	2011	150	Utility filing fee	
1111	500	2111	250	Utility Search fee	
1311	200	2311	100	Utility Examination fee	
1081	250	2081	125	Utility Application Size Fee	
1005	200	2005	100	Provisional Application Fee	
1085	250	20835	125	Provisional Application Size Fee	
SUBTOTAL (1)					(\$)0.00

2. EXTRA CLAIM FEES

	Highest Paid Claims	Extra Claims	Fee from Below	Fee Paid
Total Claims	20**	0	50.00	0.00
Independent Claims	3**	0	200.00	0.00
Multiple Dependent				

**or number previously paid, if greater; For Reissues, see below

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	50	2202	25	Claims in excess of 20
1201	200	2201	100	Independent claims in excess of 3
1203	360	2203	180	Multiple dependent claim, if not paid
1204	200	2204	100	**Reissue independent claims over original patent
1205	50	2205	25	**Reissue claims in excess of 20 and over original patent

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee (\$)	Small Entity Fee Code	Small Entity Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	
1253	1,020	2253	510	Extension for reply within third month	
1254	1,590	2254	795	Extension for reply within fourth month	
1255	2,160	2255	1,080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Filing a brief in support of an appeal	500.00
1452	500	2452	250	Petition to revive - unavoidable	
1453	1,500	2453	750	Petition to revive - unintentional	
1501	1,400	2501	700	Utility issue fee (or reissue)	
1502	800	2502	400	Design issue fee	
1504	300	2504	300	Publication Fee	
1462	400	1462	400	Petitions Director not specifically provided for Group I	
1463	200	1463	200	Petitions Director not specifically provided for Group II	
1464	130	1464	130	Petitions Director not specifically provided for Group III	
1806	180	1806	180	Submission of information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR § 1.129(b))	
Other fee (specify)					
Other fee (specify)					

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3)

(\$)500.00****

SUBMITTED BY

Name (Print/Type) Kirk D. Wong Registration No. (Attorney/Agent) 43,284 Telephone (408) 414-1080
Signature [Signature] Date January 17, 2006

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Docket No. 50325-0125 (Seq. No. 2078)

PATENT



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of	:	Confirmation No.: 4795
	:	
Ron Cohen, et al.	:	Group Art Unit: 2141
	:	
Serial No.: 09/578,027	:	Examiner: Quang N. Nguyen
	:	
Filed: May 24, 2000	:	
	:	
For: METHOD AND APPARATUS OF	:	
OPTIMIZING RETRIEVAL OF NETWORK	:	
RESOURCES	:	

APPEAL BRIEF

Board of Patent Appeals and Interferences
United States Patent and Trademark Office
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Sir:

This Appeal Brief is submitted in support of the Notice of Appeal that was filed on
November 16, 2005.

I. REAL PARTY IN INTEREST

Cisco Systems, Inc., which owns the assignee Cisco Technology, Inc., both of
San Jose, California, are the real parties in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals and interferences.

III. STATUS OF CLAIMS

Claims 1-30 are pending in the application and were finally rejected in the Final Office Action mailed on August 11, 2005 and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

The claims have not been amended after the Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present application contains independent Claims 1, 11-16, and 29. These independent claims recite similar limitations, except in the context of a method, router, cache server, proxy server, apparatus, computer-readable medium, and method, respectively. The application and claims generally address problems with improving the efficiency of Web page retrieval and display.

The set of global, packet-switched internetworks known as the Internet is in wide use. A significant proportion of the data traffic that flows through the Internet comprises requests and responses for documents or services based on protocols of the World Wide Web. Much of this traffic comprises HTML documents, or responses from services that respond to requests using HTML. A document is identified by sending a Universal Resource Locator (URL) that uniquely identifies the document from a browser to a server in the network. The hostname part of the URL is resolved, using the Domain Name Service (DNS), into an Internet Protocol (IP) address that identifies a computer that stores the document.

(Application, page 1, line 8 – line 16.)

Many client sessions involve requests for network resources that contain embedded symbolic references to other network resources. For example, a session may involve a client request for a Web page that has numerous embedded URLs that identify other Web pages or services. Embedded URLs are used to retrieve embedded objects within a Web page. An example of an embedded URL HTTP command: ``. In this HTTP statement, an embedded URL follows the "img" tag. When a Web browser identifies an embedded URL in an HTML page, the browser automatically loads the HTML document, image or service that is identified by the embedded URL. The embedded URLs may comprise HTML image tags and associated URLs, applet tags that identify a codebase, object tags that identify a codebase, data, and class id, embed tags and URLs, etc.

Thus, an embedded URL forces the Web client to resolve the hostname in order to retrieve the embedded context, even if the user does not wish to continue browsing in the site. Embedded URLs with hostnames that are different from the hostname of the page that contains the embedded URLs are used primarily for commercial advertisements. In such sessions, a significant amount of the time incurred in delivering the Web page may involve resolving the IP addresses of the embedded URLs, using DNS. The time involved in carrying out such DNS resolution significantly increases overall session time, and introduces significant message traffic to the network. (Application, page 2, lines 8-27.)

Claims 1, 11-16, and 29 are directed to optimizing retrieval of network resources such as Web pages. A network resource is received that contains one or more symbolic hostname references. Host name references in the network resource are resolved by a DNS server, for example, into corresponding network addresses. The DNS server translates a symbolic

hostname (a Universal Resource Locator (URL)) into a network address (an IP address). If a network address is successfully determined, then the network address is substituted for the symbolic hostname in the network resource. Substitutions are performed according to one or more substitution policies and may involve writing an IP address in place of a URL in the network resource. (Application, page 15, line 4 – page 16, line 2.) The modified network resource is stored in a cache for use in response to future client requests for the network resource, without the need for hostname resolution with the DNS server. Thereafter, when the modified network resource is delivered to a client, the client does not need to resolve the IP address of the hostnames in the network resource. Accordingly, page display time and the number of network messages are reduced. (Application, Figs. 2A, 2B, and 3; page 6, line 12 – page 8, line 22; page 9, line 2 – page 11, line 3; page 13, line 48 – page 14, line 19; page 17, line 14 – page 20, line 23.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-2, 4-17, 19-25 and 28-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Beranek et al.* (6,226,642) (hereinafter “*Beranek*”) in view of *Kavner* (6,366,947).

2. Claims 3, 18 and 26-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Beranek et al.* (6,226,642) in view of *Kavner* (6,366,947), as applied to claims 1 and 16 above, and further in view of Admitted Prior Art (APA).

VII. ARGUMENT

A. Introduction

It is well founded that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the references cited and relied upon must teach or suggest all the claim limitations. In addition, a sufficient factual basis to support the obviousness rejection must be proffered. *In re Freed*, 165 USPQ 570 (CCPA 1970); *In re Warner*, 154 USPQ 173 (CCPA 1967); *In re Lunsford*, 148 USPQ 721 (CCPA 1966).

With respect to the present application, it is respectfully submitted that Claims 1-30 include one or more limitations that are not taught or suggested by *Beranek* or *Kavner*. It is further submitted that a sufficient factual basis has not been proffered during the prosecution of the present application to support the rejection of Claims 1-2, 4-17, 19-25 and 28-30 under 35 U.S.C. § 103(a) as being unpatentable over *Beranek* in view of *Kavner* or the rejection of Claims 3, 18 and 26-27 under 35 U.S.C. § 103(a) as being unpatentable over *Beranek* in view of *Kavner* and further in view of Admitted Prior Art.

B. Claims 1-2, 4-17, 19-25 and 28-30 Are Patentable Over *Beranek* in View of *Kavner*

Claims 1-2, 4-17, 19-25 and 28-30 are patentable under 35 U.S.C. § 103(a) over *Beranek* in view of *Kavner* because Claims 1-2, 4-17, 19-25 and 28-30 include one or more features that are not taught or suggested by *Beranek* and *Kavner*.

1. INDEPENDENT CLAIM 1

Claim 1 is directed to a method of optimizing retrieval of electronic documents that recites:

receiving and routing network packets;
extracting a first electronic document from the network packets;
identifying one or more symbolic references to other electronic documents within the first electronic document;
determining a network address of each of the other electronic documents corresponding to each of the symbolic references;
creating and storing a modified copy of the first electronic document in which the network address is substituted for each corresponding symbolic reference in accordance with one or more substitution policies;
delivering the modified copy of the electronic document in response to all subsequent client requests for the first electronic document.

Beranek and *Kavner*, whether taken alone or in combination, do not teach or suggest the above features of Claim 1.

a. creating and storing a modified copy of the first electronic document in which the network address is substituted for each corresponding symbolic reference in accordance with one or more substitution policies

Claim 1 comprises the feature of creating and storing a modified copy of the first electronic document in which the network address is substituted for each corresponding symbolic reference in accordance with one or more substitution policies. The final Office Action asserts, on pages 3 and 4, that this feature of Claim 1 is described in col. 12, line 44- col. 13, line 25, and col. 16, lines 32-58 of *Kavner*. This is incorrect.

Kavner creates a second Winsock library that allows his invention to capture Web browser requests so he can decide whether a requested Web page is stored in the local cache. *Kavner* teaches that a pre-fetch mechanism is used during the first time a user accesses a particular Web site or page. The pre-fetch mechanism downloads data representing the HTML and graphic image Web resources from the Web site to local cache (as does the prior art as admitted by *Kavner*). *Kavner's* invention performs differently from the prior art systems

upon subsequent visits to the same Web site or page by the user. Instead of first issuing a GET request to the server with an If-Modified-Since tag before displaying the Web page to the user, *Kavner* instead immediately displays the cached Web page to the user while performing the GET request to the server with an If-Modified-Since tag in the background. The GET request to the server with an If-Modified-Since tag made in the background is triggered upon the user's subsequent request for a Web site or page stored in the local cache. (col. 4, lines 44 – 59; col. 12, lines 23 – 33; col. 13, line 60 - col. 14, line 38; col. 16, lines 26 - 58)

Kavner tracks site names (URLs) by storing the site name in the local cache. When the user's actions require that a site name be converted to a TCP/IP network address, *Kavner* checks to see if the site name exists in the local cache. If the site name is in the local cache, then the Web page associated with the site name is retrieved from the cache and immediately displayed to the user. If the site name is not in the local cache, then *Kavner* must convert the site name to a TCP/IP address using a DNS server. *Kavner* then retrieves the Web page associated with the TCP/IP address and stores the Web page data in the local cache. *Kavner* keeps the TCP/IP address in the local cache so he can perform the GET request to the server with an If-Modified-Since tag in the background if the user visits the Web site in the future. This accelerates future connections to the particular server. (col. 12, line 44 – col. 13, line 25; col. 16, lines 49 - 58)

However, the final Office Action mischaracterizes *Kavner* as well as a claimed element of Claim 1. In particular, the final Office Action states:

“Kavner teaches a system and method for accelerating network interaction using intelligent cacheing and intelligent fetching wherein a number of hypertext links such as buttons, certain words or images (*i.e.*, symbolic references), associated with additional information (*i.e.*, associated with other electronic documents) were identified by issuing the software call “GET HOST BY NAME” to the original Winsock library to retrieve the TCP/IP address of a host name from the network and

once received, the retrieved TCP/IP address is stored in the cache (*i.e., determining/substituting and storing a network address of each of the other electronic documents corresponding to each of the symbolic references*) (Kavner, C12:L44 – C13:L25 and C16:L32-58).”

The final Office Action states that the element in Claim 1 in question is:

“determining/substituting and storing a network address of each of the other electronic documents corresponding to each of the symbolic references”

However, the actual claimed element is:

“creating and storing a modified copy of the first electronic document in which the network address is substituted for each corresponding symbolic reference in accordance with one or more substitution policies”

“All words in a claim must be considered in judging the patentability of that claim against the prior art.” In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

In any event, *Kavner* does not teach or disclose what the final Office Action posits. As evidenced above, *Kavner* does not teach or disclose any type of substitution of symbolic references with network addresses. *Kavner* clearly teaches that Web pages, site names, and TCP/IP addresses are stored in a local cache upon the user’s first visit to the Web pages and are meant for future retrieval of Web content requested by the user. When a user revisits a Web page, *Kavner* checks the local cache for the site name. If the site name is stored in the local cache, then the corresponding Web page is also stored in the local cache and is retrieved from the local cache and sent to the user’s Web browser. The network address for the site name is used to perform a background request to the server to check for any modifications to the Web page. *Kavner* makes no changes or substitutions on the Web page because there is no

need to since *Kavner* has a second Winsock library intercepting the Web browser's requests. That means that the Web page stays in its original authored form.

Therefore, *Kavner* does not teach or suggest any substitution of a network address for corresponding symbolic references in a modified copy of a first electronic document.

b. The final Office Action does not establish a *prima facie* case of obviousness.

The final Office Action's reasoning for combining *Beranek* and *Kavner* is based on a misinterpretation of *Kavner*. The final Office Action states:

"Since *Beranek* teaches that URLs in a document can be modified/substituted (by adding and modifying hyperlinks, changing URLs or displaying other URLs, embedded files, etc., according to some given protocol or filter property, i.e., in accordance with substitution policies), it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of *Beranek* and *Kavner* to include identifying one or more symbolic references to other electronic documents within the first electronic document, determining and substituting a network address of each of the other electronic documents corresponding to each of the symbolic references since such methods were conventionally employed in the art to allow the system to identify, retrieve, and store the network TCP/IP addresses (URLs) corresponding to the hypertext links (e.g., symbolic references) in the cache, to pre-load hypertext links in order to more speedily retrieve the information which the user is likely to require in a subsequent interaction (*Kavner* C3:L31-38)."

It is clear from the discussion above, that *Kavner* does not teach or disclose a system where the network address is substituted for each corresponding symbolic reference as cited in an element of Claim 1, which the final Office Action misquotes as "determining and substituting a network address of each of the other electronic documents corresponding to each of the symbolic references". *Kavner* does not teach what the final Office Action assumes.

Given the teachings of *Kavner*, combining *Beranek* and *Kavner* as the final Office Action suggests would result in *Beranek* storing Web pages, site names, and TCP/IP addresses

in a local cache upon the user's first visit to the Web pages for future retrieval of Web content requested by the user. This is not what is claimed in Claim 1. Therefore, the combination of *Beranek* and *Kavner* does not teach all of the claim limitations of Claim 1.

Further, Applicant notes that the final Office Action confuses URLs with TCP/IP network addresses. The final Office Action states: "... and store the network TCP/IP addresses (URLs) corresponding to the hypertext links (*e.g., symbolic references*) in the cache ...". This statement is technically incorrect. It is well known in the art that URLs are not TCP/IP network addresses. As discussed above, URLs are sent to DNS servers to be translated to a TCP/IP network address. However, URLs are typically in hypertext links. Therefore, URLs and TCP/IP network addresses are not equivalent in the manner that the final Office Action assumes.

For all the foregoing reasons, the rejection of Claim 1 under 35 U.S.C. §103(a) is unsupported in the cited references. Reversal of the rejection is respectfully requested.

2. INDEPENDENT CLAIMS 11-16 AND 29

Claims 11-16 and 29 include features similar to the features of Claim 1 discussed above. These independent claims recite similar limitations, except in the context of a method, router, cache server, proxy server, apparatus, computer-readable medium, and method, respectively. For the reasons discussed above with respect to Claim 1, the rejections of Claims 11-16 and 29 are unsupported by the cited references. Reversal of the rejections of Claims 11-16 and 29 under 35 U.S.C. § 103(a) is respectfully requested.

3. DEPENDENT CLAIMS 2, 4-10, 19-25, 28, and 30

Claims 2, 4-10, 19-25, 28, and 30 are each dependent upon one of independent Claims 1, 16, and 29, and thus include each and every feature of the base independent claim. For the reasons stated above with respect to Claims 1, 11-16, and 29, the rejections of Claims 2, 4-10, 19-25, 28, and 30 are unsupported by the cited references. Reversal of the rejections of Claims 2, 4-10, 19-25, 28, and 30 under 35 U.S.C. § 103(a) is respectfully requested.

C. Claims 3, 18 and 26-27 are patentable over *Beranek et al.* in view of *Kavner*, as applied to claims 1 and 16 above, and further in view of Admitted Prior Art (APA)

Claims 3, 18 and 26-27 are each dependent upon one of independent Claims 1 and 16, and thus include each and every feature of the base independent claim. For the reasons stated above with respect to Claims 1, 11-16, and 29, the rejections of Claims 3, 18 and 26-27 are unsupported by the cited references. Reversal of the rejections of Claims 3, 18 and 26-27 under 35 U.S.C. § 103(a) is respectfully requested.

VIII. CONCLUSION AND PRAYER FOR RELIEF


Based on the foregoing, the Appellants respectfully submits that the rejections of Claims 1-30 under 35 U.S.C. § 103(a) as allegedly unpatentable over *Beranek* in view of *Kavner* lacks the requisite factual and legal bases. The Appellants respectfully submit that the imposed rejections under 35 U.S.C. § 103(a) over *Beranek* in view of *Kavner* are **not** viable and respectfully solicit the Honorable Board to **reverse** each of the imposed rejections under 35 U.S.C. § 103(a).

To the extent necessary to make this reply timely filed, the Applicant petitions for an extension of time under 37 C.F.R. § 1.136.

If any applicable fee is missing or insufficient, throughout the pendency of this application, the Commissioner is hereby authorized to any applicable fees and to credit any overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP


Kirk D. Wong
Reg. No. 43,284

Date: January 17, 2006

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Claims Appendix

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on January 17, 2006

by 

VIII. CLAIMS APPENDIX

1. (Previously Presented) A method of optimizing retrieval of electronic documents, comprising the computer-implemented steps of:
 - receiving and routing network packets;
 - extracting a first electronic document from the network packets;
 - identifying one or more symbolic references to other electronic documents within the first electronic document;
 - determining a network address of each of the other electronic documents corresponding to each of the symbolic references;
 - creating and storing a modified copy of the first electronic document in which the network address is substituted for each corresponding symbolic reference in accordance with one or more substitution policies;
 - delivering the modified copy of the electronic document in response to all subsequent client requests for the first electronic document.
2. (Original) A method as recited in Claim 1, further comprising the steps of delivering an unmodified copy of the first electronic document in response to a client request for the first electronic document, concurrently while performing the steps of identifying, determining, creating and storing.
3. (Original) A method as recited in Claim 1, further comprising the steps of:
 - determining that a plurality of the symbolic references identify one particular host name;
 - substituting a different network address in each of the symbolic references that identify the particular host name, wherein each different network address is associated with one of a plurality of replicated servers.

4. (Previously Presented) A method as recited in Claim 1, further comprising the steps of creating and storing the modified copy in cache storage; delivering the modified copy from the cache in response to all subsequent client requests for the first electronic document.
5. (Original) A method as recited in Claim 4, further comprising the steps of:
retrieving and storing in the cache storage, each of the other electronic documents;
carrying out the steps of identifying, determining, creating and storing, and delivering for each of the other electronic documents in the cache storage, before or at the same time as receiving one or more client requests for the other electronic documents.
6. (Original) A method as recited in Claim 1, further comprising the steps of:
determining that one or more of the symbolic references identifies a prohibited network resource;
substituting a network address of a pre-determined network resource for the symbolic references to the prohibited network resource.
7. (Original) A method as recited in Claim 6, wherein the pre-determined network resource is a pre-defined electronic document that comprises a message specifying that access to the prohibited network resource is prohibited.
8. (Original) A method as recited in Claim 1, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise only embedded URLs in the HTML document.
9. (Previously Presented) A method as recited in Claim 1, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise only selected URLs in the HTML document as determined according to a substitution policy.

10. (Original) A method as recited in Claim 1, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise all URLs in the HTML document.
11. (Previously Presented) A method of optimizing access to a network resource, comprising the computer-implemented steps of:
 - receiving a network resource that contains one or more embedded symbolic host name references;
 - determining a network address corresponding to each of the embedded symbolic host name references;
 - creating and storing on a cache server a modified copy of the network resource in which a network address is substituted for each corresponding embedded symbolic host name reference in accordance with one or more substitution policies;
 - using the modified copy of the network resource in responding to all subsequent client requests for the network resource, thereby greatly reducing the required number of network address lookup operations.
12. (Previously Presented) A router that includes a stored program comprising one or more sequences of instructions for optimizing retrieval of network resources, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:
 - receiving and routing network packets;
 - extracting data packets of a network resource that contains one or more embedded symbolic host name references;
 - determining a network address corresponding to each of the embedded symbolic host name references;

creating and storing on the router a modified copy of the network resource in which a network address is substituted for each corresponding embedded symbolic host name reference in accordance with one or more substitution policies;

using the modified copy of the network resource in delivering the network resource to a client, thereby greatly reducing the required number of network address lookup operations.

13. (Previously Presented) A cache server that includes a computer-readable medium carrying one or more sequences of instructions for optimizing retrieval of network resources, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

receiving a network resource that contains one or more embedded symbolic host name references;

determining a network address corresponding to each of the embedded symbolic host name references;

creating and storing on the cache server a modified copy of the network resource in which a network address is substituted for each corresponding embedded symbolic host name reference in accordance with one or more substitution policies;

using the modified copy of the network resource in responding to all subsequent client requests for the network resource, thereby greatly reducing the required number of network address lookup operations.

14. (Previously Presented) A proxy server that includes a computer-readable medium carrying one or more sequences of instructions for optimizing retrieval of network resources, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

receiving a network resource that contains one or more embedded symbolic host name references;

determining a network address corresponding to each of the embedded symbolic host name references;

creating and storing on the proxy server a modified copy of the network resource in which a network address is substituted for each corresponding embedded symbolic host name reference in accordance with one or more substitution policies;

using the modified copy of the network resource in responding to all subsequent client requests for the network resource, thereby greatly reducing the required number of network address lookup operations.

15. (Previously Presented) Apparatus for optimizing retrieval of electronic documents, comprising:

means for receiving and routing network packets;

means for extracting a first electronic document from the network packets;

means for identifying one or more symbolic references to other electronic documents within the first electronic document;

means for determining a network address of each of the other electronic documents corresponding to each of the symbolic references;

means for creating and storing on a cache server a modified copy of the first electronic document in which the network addresses are substituted for all corresponding symbolic references in accordance with one or more substitution policies;

means for delivering the modified copy of the electronic document in response to all subsequent client requests for the first electronic document.

16. (Previously Presented) A computer-readable medium carrying one or more sequences of instructions for optimizing retrieval of network resources, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

receiving and routing network packets;

extracting a network resource that contains one or more embedded symbolic host name references from the network packets;

determining a network address corresponding to each of the embedded symbolic host name references;

creating and storing a modified copy of the network resource in which a network address is substituted for each corresponding embedded symbolic host name reference in accordance with one or more substitution policies;

using the modified copy of the network resource in responding to all subsequent client requests for the network resource, thereby greatly reducing the required number of network address lookup operations.

17. (Original) A computer-readable medium as recited in Claim 16, further comprising the steps of delivering an unmodified copy of the first electronic document in response to a client request for the first electronic document, concurrently while performing the steps of identifying, determining, creating and storing.

18. (Original) A computer-readable medium as recited in Claim 16, further comprising the steps of:

determining that a plurality of the symbolic references identify one particular host name;

substituting a different network address in each of the symbolic references that identify the particular host name, wherein each different network address is associated with one of a plurality of replicated servers.

19. (Original) A computer-readable medium as recited in Claim 16, further comprising the steps of creating and storing the modified copy in cache storage of a cache server that executes the method; delivering the modified copy from the cache in response to all subsequent client requests for the first electronic document.
20. (Original) A computer-readable medium as recited in Claim 19, further comprising the steps of:
 - retrieving and storing in the cache storage, each of the other electronic documents;
 - carrying out the steps of identifying, determining, creating and storing, and delivering for each of the other electronic documents in the cache storage, before or at the same time as receiving one or more client requests for the other electronic documents.
21. (Original) A computer-readable medium as recited in Claim 16, further comprising the steps of:
 - determining that one or more of the symbolic references identifies a prohibited network resource;
 - substituting a network address of a pre-determined network resource for the symbolic references to the prohibited network resource.
22. (Previously Presented) A computer-readable medium as recited in Claim 16, wherein the pre-determined network resource is a pre-defined electronic document that comprises a message specifying that access to a prohibited network resource is prohibited.
23. (Original) A computer-readable medium as recited in Claim 16, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise only embedded URLs in the HTML document.

24. (Previously Presented) A computer-readable medium as recited in Claim 16, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise only selected URLs in the HTML document as determined according to a substitution policy.
25. (Original) A computer-readable medium as recited in Claim 16, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise all URLs in the HTML document.
26. (Original) A method as recited in Claim 1, wherein the step of determining a network address of each of the other electronic documents corresponding to each of the symbolic references comprises load balancing by the steps of successively selecting a different one of a plurality of pre-determined network addresses of a plurality of servers for substitution for successive identical symbolic hostname references.
27. (Original) A computer-readable medium as recited in Claim 16, wherein the step of determining a network address of each of the other electronic documents corresponding to each of the symbolic references comprises load balancing the steps of successively selecting a different one of a plurality of pre-determined network addresses of a plurality of servers for substitution for successive identical symbolic hostname references.
28. (Original) A method as recited in Claim 1, wherein the electronic document comprises an HTML document, and wherein the symbolic references comprise hostnames in embedded URLs in the HTML document and hostnames in hyperlinks in the HTML document.
29. (Previously Presented) A method of optimizing retrieval of electronic documents, comprising the computer-implemented steps of:
 - receiving and routing network packets;
 - extracting a first electronic document from the network packets;

identifying one or more symbolic host names contained only in one or more embedded Universal Resource Locators (URLs) within the first electronic document;

determining a network address of each host corresponding to each of the host names;

creating and storing on a cache server a modified copy of the first electronic document in which the network address is substituted for each of the host names in accordance with one or more substitution policies;

delivering the modified copy of the electronic document in response to all subsequent client requests for the first electronic document.

30. (Original) A method as recited in Claim 29, further comprising the steps of:

identifying one or more second host names contained in one or more hyperlinks delineated by anchor tags within the first electronic document;

determining a second network address of each second host corresponding to each of the second host names;

storing the second network addresses in place of each of the second host names in the modified copy of the first electronic document.